METHOD, APPARATUS, AND PROGRAM PRODUCT FOR CONDUCTING BINGO GAMES WITH PRE-ASSIGNED BINGO CARDS AND PRE-MATCHED BINGO CARD SETS

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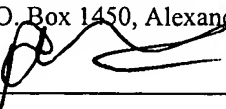## CLIFTON LIND

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**METHOD, APPARATUS, AND PROGRAM PRODUCT FOR
CONDUCTING BINGO GAMES WITH PRE-ASSIGNED BINGO CARDS
AND PRE-MATCHED BINGO CARD SETS**

5   CROSS-REFERENCE TO RELATED APPLICATION

6   The Applicants claim the benefit, under 35 U.S.C. §119(e), of U.S. Provisional Patent

7   Application 60/515,289 filed October 29, 2003 and entitled METHOD, APPARATUS, AND

8   PROGRAM PRODUCT FOR CONDUCTING BINGO GAMES WITH PRE-ASSIGNED

9   BINGO CARDS AND PRE-MATCHED BINGO CARD SETS. The entire content of this

10   provisional application is incorporated herein by this reference.

11

12   TECHNICAL FIELD OF THE INVENTION

13   This invention relates to gaming and gaming systems. More particularly, the invention

14   relates to a bingo-type gaming system in which a set of bingo card representations is pre-matched

15   to produce a set of game play records which are later assigned to players holding cards from the

16   set of bingo card representations. The invention encompasses a method of awarding results in a

17   bingo game and an apparatus and program product for implementing the gaming system.

18

19   BACKGROUND OF THE INVENTION

20   Bingo-type games are played with predefined bingo cards that each include a number of

21   bingo designations such as Arabic numerals randomly arranged in a desired manner, commonly

22   in a grid. The bingo designations on the cards are selected from a pool of available designations.

23   In more traditional bingo-type games the cards are physically printed on paper or other suitable

1   material. These traditional printed cards are purchased by players prior to the start of a game.

2   Once all the cards for a game have been purchased, designations from the available pool of

3   designations are selected at random. As the designations are selected and announced in the

4   game, the players match the randomly selected designations with the designations printed on

5   their respective card or cards. This matching and marking of matched designations on the bingo

6   card is commonly referred to as "daubing" the card. The player first producing a predetermined

7   pattern of matches between the randomly selected designations and the printed card designations

8   on a single card, and then announcing "bingo" to claim the win, is considered the winner.

9   Consolation prizes may be awarded to players having cards matched to produce consolation prize

10   patterns at the time of the winning pattern.

11   There are numerous variations on the traditional bingo game. Some bingo-type games

12   perform a draw to produce a set of designations prior to the sale of printed bingo cards. These

13   bingo-type games use printed cards like regular printed bingo cards, but with the card face

14   concealed in some fashion. Once a player purchases one of these covered face bingo cards, the

15   player can reveal the card face and match the drawn designations to the printed card designations

16   to determine if the matched designations produce some predetermined winning pattern.

17   Another variation of the traditional bingo game is played with electronic bingo card

18   representations rather than the traditional printed bingo cards. In these bingo-type games, each

19   bingo card is represented by a data structure that defines the various card locations and

20   designations associated with the locations. The game is played through player stations connected

21   via a communications network. A central computer system in the network may be responsible

1   for storing the bingo card representations and distributing or communicating bingo card

2   representations to players at the player stations. The player stations display the bingo cards

3   defined by the card representations and also allow the players to daub or mark designation

4   matches as game designations are announced in the game. A primary advantage of this

5   electronic bingo game is that the games may be played at a much faster pace than is practical

6   with traditional paper bingo. Another advantage of this electronic version of bingo is that the

7   games can be administered and controlled from a remote location and actually played at a

8   number of different bingo establishments.

9   Another electronic bingo gaming system is disclosed in United States patent application

10 serial number 10/028,889, filed December 20, 2001, and entitled "Method and Program Product

11 for Producing and Using Game Play Records in a Bingo-Type Game," and in United States

12 provisional patent application serial No. 60/265,100, filed January 30, 2001 and entitled "Object

13 Draw Gaming System and Program Product." The entire content of each of these applications is

14 incorporated herein by this reference. In the bingo system described in these applications, a set

15 of bingo card representations is pre-matched with a set of bingo designations to create a matched

16 card set. The matched card set includes a data record corresponding to each matched card and

17 this data record includes an indicator of the result achieved by the card upon matching the card

18 with the set of bingo designations. These game records are assigned to players in the gaming

19 system in response to player requests.

20   Traditional bingo games, either played with paper cards or electronic card representations

21 are limited in the manner in which the results of a game may be displayed. In order to maintain

1   player interest in the game, it is desirable to have an option of displaying results to the players in

2   a variety of different fashions. It is also desirable to further increase the speed at which bingo-

3   type games may be played. Yet it is essential that the game retain the basic characteristics of a

4   bingo-type game, namely that the game is played with predefined cards or card representations

5   which are matched or daubed against randomly generated designations, and the game winner is

6   the first player to match the designations in a predetermined winning pattern on his or her card or

7   card representation.

8

9   SUMMARY OF THE INVENTION

10   A gaming system embodying the principles of the present invention utilizes a game

11 designation generating component, a gaming establishment component, and at least one set of

12 predefined card representations. Each card representation is a representation of a bingo card

13 stored in electronic format as a data structure or data record defining a predefined pattern (often

14 but not necessarily a grid) of game designations chosen from a pool of available designations.

15 The game designations associated with a given card representation may be referred to as card

16 designations. The game designation generating component generates sets of game designations

17 from a pool of available designations. Results for each card representation for a particular game

18 are identified by matching the card designations for the respective card representation to a game

19 designation set produced for that game. This matching of card designations for the respective

20 card representations in a card set to a game designation set will be referred to in this disclosure

21 and the accompanying claims as "matching a game designation set with a card representation

1   set." A card representation that matches a given game designation set in a predetermined game

2   ending pattern is considered a game ending card or game ending winner for the given game

3   designation set and may commonly be associated with some prize. Card representations that

4   match the given set of game designations in other predetermined patterns under a given set of

5   matching rules may also be considered winning cards and may be awarded other prizes.

6   A method according to the present invention includes matching the card representations

7   to a given set of game designations to produce a matched card set. Each matched bingo card

8   representation in the matched card set represents a respective game play record for use in the

9   present gaming system. The matched card set thus includes a number of game play records, each

10   corresponding to a different one of the bingo card representations. Each game play record in the

11   matched card set includes or is associated with a result indicator that indicates whether the

12   respective bingo card representation is a winning card or losing card for that set of game

13   designations. The game play record associated with a card representation that achieves a game

14   ending pattern for a given designation set is considered a game ending game play record.

15   Individual game play records from matched card set are assigned to players in response to

16   game play requests initiated by the players. Each game play request is associated with a player

17   by virtue of the player initiating the game play request. Each game play request is also associated

18   with a particular card representation that is "owned" or held by the player. Players are assigned

19   one or more card representations to allow the player to make game play requests. The card

20   representations are assigned to the player preferably in the form of some physical media as either

21   a data structure, card representation identifier, a printed representation of the card, or some

1   combination of these. Card representations may be assigned to a player at the beginning of a

2   gaming session for the player, immediately prior to each game play request or as part of initiating

3   a game play request, or at other times within the scope of the present invention. For example,

4   one or more card representations may be permanently assigned to a player and the player may use

5   the card representation or representations in numerous different gaming sessions over a period of

6   hours, days, months, or longer.

7   In the play of a bingo-type game according to the invention, a set of game designations is

8   determined by the game designation generating component. A processing device included in the

9   gaming establishment component matches the set of bingo card representations to the set of game

10   designations provided by the game designation generating component and preferably stores the

11   resulting matched card set. The matched card set is stored in a secure fashion so that no one can

12   see the results of the pre-matching and thus the result associated with any game play record in the

13   set.

14   Once the matched card set is created and ready for play, a player at the gaming

15   establishment component may purchase or otherwise request a game play record from the set

16   through a player station included in the gaming establishment component. That is, in response to

17   a game play request initiated by the player at a player station, the player is assigned a game play

18   record from the respective matched card set. The game play record that is assigned for a given

19   game play request is the game play record from the matched card set that corresponds to the card

20   representation that is associated with the requesting player for the respective game play request.

21   Thus, the assignment of a game play record to a player is representative of the player playing a

1 bingo game and obtaining the result for the bingo game for the card that the player has obtained

2 for play of the game. The information that the player station actually receives in response to a

3 game play request is sufficient to allow the player station to display the result associated with the

4 game play record, that is, the result of matching the respective card representation to the given set

5 of game designations. If the card representation associated with the game play request matches

6 the game designations to produce one of the predetermined winning patterns, the player receives

7 credits or winnings. However, if the card representation associated with the game play request

8 does not match the game designations to produce one of the predetermined winning patterns, the

9 player receives no winnings or credits.

10 Because each matched card set will have only a single a game play result corresponding

11 to each respective card representation, once a player that is associated with a given card

12 representation has been assigned a game play result from a given matched card set, that matched

13 card set is exhausted with respect to that card representation. That is, there will then be no

14 further game play records remaining in that matched card set to assign for a game play request

15 associated with that particular card representation. Thus, in order to allow a player to continue to

16 play with their associated card representation, the present invention supplies additional matched

17 card sets, preferably in one of two ways. The first preferred manner in which the system may

18 make additional matched card sets available to the players is by maintaining a number of active

19 matched card sets from which game play records may be assigned in response to game play

20 requests. Once a game play record for a given card representation has been assigned from a first

21 matched card set, the next game play request associated with that card representation is assigned

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1   from an additional matched card set. The first matched card set remains active for assigning

2   game play records corresponding to other card representations that have not thus far been

3   associated with a game play request.

4   The second preferred manner in which the system may make additional matched card sets

5   available to the players is by maintaining a given matched card set available for play for only a

6   limited amount of time, and then repeatedly making a new matched card set available for

7   assignment of game play records at short intervals. The intervals in which matched card sets are

8   made available for play, that is, for assignment of game play records, is kept short enough to

9   prevent a game player from having to wait to make a game play request associated with a given

10   card.

11   Regardless of the manner in which matched card sets are made available for play, a game

12   according to the invention, that is, a game using a single matched card set, may end once a player

13   (a game winning player) has received or has been assigned a game play record corresponding to a

14   card representation matched to produce a particular predetermined game ending pattern. Thus,

15   the game ending pattern sets the criteria for ending a bingo-type game pursuant to the invention.

16

17   BRIEF DESCRIPTION OF THE DRAWINGS

18   Figure 1 is a diagrammatic representation of a gaming system embodying the principles

19   of the invention.

20   Figure 2 is a diagrammatic representation of an alternate gaming system embodying the

21   principles of the invention.

1   Figure 3 is a diagrammatic representation of a gaming establishment component

2   according to one form of the present invention.

3   Figure 4 is a diagrammatic representation of the point-of-sale terminal and player station

4   included in one preferred form of the present gaming system.

5   Figure 5 is a representation of a game card used in the present invention.

6   Figure 6 is a flow chart showing the process steps associated with the overall play of a

7   game embodying the principles of the present invention.

8   Figure 7 is a flow chart showing process steps associated with the operation of the point-

9   of-sale terminals.

10   Figure 8 is a flow chart showing process steps associated with the operation of the player

11   stations.

12   Figure 9 is a flow chart showing process steps at the central computers.

13   Figure 10 is a diagrammatic representation of a portion of the data representing a matched

14   card set according to one preferred form of the present invention.

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16   DESCRIPTION OF PREFERRED EMBODIMENTS

17   The claims at the end of this application set out novel features which the Applicants

18   believe are characteristic of the invention. The various advantages and features of the invention

19   together with preferred modes of use of the invention will best be understood by reference to the

20   following description of illustrative embodiments read in conjunction with the accompanying

21   drawings.

1   Referring to Figure 1, a gaming system 10 embodying the principles of the invention

2   includes at least one and preferably many gaming establishment components 11 each having a

3   back office system 12 and a gaming floor or casino floor system 14. Gaming system 10 also

4   includes a designation generating component 16 in communication with each gaming

5   establishment component 11. Gaming floor system 14 is accessible to the public and allows

6   players to establish and modify accounts in gaming system 10. Players also use gaming floor

7   system 14 to participate in various games available through gaming system 10. Back office

8   system preferably 12 maintains accounts and account balances for players, maintains account

9   information, and provides system usage reports and other reports useful in managing gaming

10   activities at the particular gaming establishment component 11. Each back office system 12 also

11   matches electronic bingo cards (card representations) to sets of game designations, stores the

12   matched card sets, and assigns the game play records from the matched card sets in response to

13   player requests made through the respective gaming floor system 14.

14   For each game played according to the invention, designation generating component 16

15   produces a series or set of game designations and communicates the set of game designations to

16   the various gaming establishment components 11. In one preferred form of the invention,

17   designation generating component 16 includes an automated ball draw system which

18   automatically draws a desired number of balls or other objects from a group of such objects.

19   Each object is associated with a designation so that the series of objects drawn by the device

20   identifies or defines a set of game designations. Alternatively to the object draw device,

21   designation generating component 16 may comprise any suitable arrangement for generating

1   designations at random from a pool of available designations to produce the desired set of game

2   designations. Regardless of how the set of game designations is produced, the resulting set of

3   designations is communicated to the gaming establishment components 11. A secure

4   communications arrangement is used to provide communications from designation generating

5   component 16 to the various gaming establishment components 11.

6   Figure 2 shows an alternate gaming system embodiment 10'. In this form of the

7   invention, designation generating component 16' is dedicated to a single gaming establishment

8   component 11'. In particular, designation generating component 16' is implemented as part of the

9   back office system 12' for gaming establishment component 11'. As a further alternative

10   arrangement, designation generating component 16' may be connected to communicate sets of

11   game designations not only to the local gaming establishment component 11', but also to another

12   gaming establishment component 11" shown in dashed lines in Figure 2.

13   Figure 3 shows further detail of a single gaming establishment component 11. As shown

14   in Figure 3, a secure communications arrangement facilitates communications between back

15   office system 12 and gaming floor system 14. Security may be enhanced with hardware firewalls

16   17 connected in the communications lines 18a and 18b which extend to gaming floor system 14

17   and/or by firewall software operating on the various computers that make up back office system

18   12.

19   Back office system 12 includes a number of separate processing devices interconnected

20   through a suitable communications arrangement. In the illustrated form of the invention, back

21   office system 12 comprises a local area network of individual processing devices and includes a

1   switching hub (network switch) 20 to which each separate processing device connects. The two

2   floor system communication links 18a and 18b also connect into switching hub 20.

3   The illustrated preferred form of back office system 12 shown in Figure 3 includes one or

4   more card set computers 26, a database computer 28, a management computer 30, an archive

5   computer 32, and two separate central computers or processors 34 and 36. Card set computer 26

6   produces and stores one or more matched card sets, each matched card set including a number of

7   game play records. Each game play record corresponds to an individual card representation in a

8   set of card representations used in creating the matched card sets. The matched card sets, or

9   rather, data representing the matched card sets, are stored in a suitable storage device (not shown)

10   associated with or accessible by card set computer 26 until a new or unused set is requested by

11   one of the central computers 34 or 36. At that time, at least one matched card set is

12   communicated to the requesting central computer. Card set computer 26 may also be used to

13   manufacture the set or sets of card representations to be used in the system. Alternatively, one or

14   more sets or perms of card representations may be generated elsewhere and stored in card set

15   computer 26 to be used in producing the desired matched card sets. It will be noted that the

16   invention requires only a single set of card representations to be used in creating numerous

17   matched card sets; however, different sets of card representations may be used to create matched

18   card sets within the scope of the present invention. The structure of the individual card

19   representations will be discussed further below with reference to Figure 5 and the structure of the

20   matched card sets and game play records will be discussed below with reference to Figure 10.

1   In the preferred form of the invention shown in Figure 3, card set computer 26 may also

2   control a local object draw device or other game designation generating device (such as device

3   16' shown in Figure 2) and receive sets of game designations from that device. Where software

4   code is executed to generate the required sets of game designations, the game designation

5   generation code may be executed by card set computer 26. As a further alternative, the object

6   draw or other device may include its own dedicated controller or processor which supplies sets of

7   game designations to card set computer 26. In the implementation of the invention shown in

8   Figure 1, card set computer 26 may receive sets of game designations from the remote game

9   designation generating component (16 in Figure 1) through any suitable communications

10   arrangement or through physically distributed media such as tapes, compact disks, removable

11   hard disks, or integrated circuit memory devices, for example.

12   Each central computer 34 and 36 is programmed to communicate with card set computer

13   26, database computer 28, and with a particular group of gaming floor devices. Figure 3 shows

14   two separate groups of gaming floor devices, group 37 and group 38, for purposes of example.

15   Central computer 34 is programmed to communicate with each of the gaming floor devices in

16   group 37, while central computer 36 is programmed to communicate with each of the gaming

17   floor devices in group 38.

18   Each central computer 34 and 36 stores data representing one or more matched card sets

19   provided from card set computer 26 for use by the gaming floor devices as described below.

20   Each central computer 34 and 36 also receives information from the various gaming floor

21   devices in the respective group. Some of this information is stored in database computer 28. For

1   example, central computer 34 receives bingo card requests and game play requests from devices

2   in group 37. Central computer 34 also responds to the bingo card requests and game play

3   requests received from devices in group 37.

4   The multiple central computer arrangement shown in Figure 3 provides several

5   advantages. First, in the event that one of the central computers 34 or 36 experiences a technical

6   problem which prevents it from operating properly, only a single group of gaming floor devices

7   is affected. Second, the multiple central computer arrangement shown in Figure 3 is readily

8   scalable to increase or decrease the number of gaming floor devices supported by the system.

9   Furthermore, the multiple central computer arrangement allows faster communications with the

10   gaming floor devices and therefore increases the speed at which a player may play the game or

11   games offered through gaming system 10.

12   Database computer 28, along with its associated data storage device or devices (such as

13   one or more hard drives accessible to the database computer for example), serves as a data

14   storage repository for storing all player records and system usage information. Most importantly

15   for the present invention, database computer 28 stores databases that may be used by the system

16   in servicing bingo card requests and game play requests. Database computer 28 may also collect

17   and store usage information indicating the gaming floor devices players have used, and the extent

18   of use.

19   Numerous different database structures for use in database computer 28 will be apparent

20   to those of ordinary skill in database development and application. The invention encompasses

1   any suitable database structure for maintaining the player and other information required in the

2   operation of the gaming system 10.

3   Management computer 30 operates under the control of management software to provide

4   system reports including real-time reports and system usage and performance reports of interest

5   to the system operators, managers, or regulators. The software executed at management

6   computer 30 also may be used to schedule administrative functions required or helpful for the

7   database computer system 28. Management computer 30 may include a suitable display for

8   providing a user interface and for displaying reports and other information. Although not shown

9   in Figure 3, a printer may also be included in the back office portion of the network or may be

10   connected directly to management computer 30 for printing system reports and usage records.

11   In the preferred form of the invention, central computers 34 and 36 send used matched

12   card sets back to card set computer 26. Card set computer 26 then periodically sends the used

13   matched card sets to archive computer 32 which serves as a repository for used matched card

14   sets. Archive computer 32 is also preferably used to store a copy of each complete unused

15   matched card set as well. These unused matched card set copies and used matched card sets may

16   be archived or stored in any suitable fashion in a nonvolatile memory or storage device

17   associated with the archive computer 32.

18   Referring now to the gaming floor devices shown in Figure 3, each group 37 and 38

19   includes a number of player stations 40 and a point-of-sale or cashier terminal (POS) 41, all

20   connected to a local area network communications hub or switch 42. Although not shown in the

21   figure, each group may also include one or more remote point-of-sale (RPOS) terminals, and one

1   or more kiosks also connected to the communications hub 42. The communications hub 42 of

2   each gaming floor group is connected to hub 20 of the back office system 12 through one of the

3   communications lines 18a or 18b.

4   So as not to obscure the present invention in unnecessary detail, the following description

5   of the various gaming floor and back office components and their operation will focus on those

6   aspects of the components pertinent to the present invention and will omit other aspects of the

7   components. In particular, game accounting functions and elements of the gaming floor

8   components involved in game accounting will generally be omitted from the following

9   disclosure. It will be appreciated that the present invention is not in any way limited to use with

10 any particular game accounting system. Rather, the present invention may be implemented with

11 cash based accounting systems, cashless systems, or combination cash and cashless systems.

12 Each of these types of accounting systems will require various elements such as card readers,

13 receipt or voucher printers, and/or other elements at the various gaming floor components.

14 As shown in Figure 4, each player station 40 may include a processor 44, a touch screen

15 display 45, a control panel 46, and a player card reader/data entry device 47. Player station

16 software executed by processor 44 receives information from player card reader/data entry device

17 47 to allow the player to participate in the games available through the player station by placing

18 their respective bingo card or cards from the card representation set or sets in play and obtaining

19 the corresponding game play records from one or more matched card sets. The player station

20 software also causes display 35 to show a player the results of play as dictated by the result

21 associated with the game play record corresponding to the card representation which the player

1   has placed in play for a given matched card set. Further information on the operation of the

2   player stations will be described below with reference to Figure 8. Further information on the

3   assignment of game play records from a matched card set will be described below with reference

4   to Figures 6 and 11.

5   In addition to its functions in the particular gaming accounting system used in system 10,

6   the example POS terminal 41 shown in Figure 4 enables a player to obtain or purchase one or

7   more card representations which the player may later place in play at a player station 40. In

8   alternative forms of the invention, POS terminal 41 may allow a player to actually initiate a game

9   play request and receive results in the form of a printed ticket or some other form. POS terminal

10   41 comprises a computer system having a processor 50 and a player/cashier interface including a

11   player card reader 51, player card printer/encoder 52, a receipt/bingo card printer 53, and keypad

12   54. POS terminal 41 also includes a cash drawer 57 which is accessible by a POS cashier or

13   attendant. Processor 50 included in POS terminal 41 executes operational software to perform

14   the steps described below with reference to Figure 7.

15   Referring now to Figure 5, each card representation comprises a data structure that

16   defines a grid 60 or other arrangement of designations 63. The illustrated grid 60 may be

17   referred to as a nine-spot grid or card having nine separate locations 61 arranged in a three-by-

18   three pattern. It will be appreciated that the grid shown in Figure 5 is shown only for purposes of

19   example and that the invention is not limited to such a structure. Five-by-five grids or any other

20   suitable arrangements of designations may be used in lieu of the illustrated three-by-three grid.

21   For purposes of example only, the separate locations 61 on the illustrated three-by-three grid are

1   numbered one through nine by the location identifying numbers 62 appearing in the upper left

2   hand corner of each location. Each grid has a random arrangement of card designations 63

3   positioned at the various locations or spots 61 of the grid. In the illustrated example, card

4   designations 63 comprise Arabic numerals. The designation residing at location 1 comprises the

5   numeral 8 while the designation residing at grid location 2 is the numeral 6, and so forth as

6   indicated in the illustration. The designations associated with the various locations 61 of the grid

7   are selected from a pool of available designations.

8   Although the physical three-by-three grid is shown for purposes of illustrating a bingo

9   card representation according to the present gaming system 10, it will be appreciated that the grid

10 is actually represented in electronic form for use in the system. The data required to define a

11 given grid or physical card to provide a card representation may be arranged in any suitable

12 fashion. For example, the grid may be represented by a series of the nine numerals with the first

13 numeral in the series representing the designation at location 1, the second numeral in the series

14 representing the designation at location 2 and so forth. In this format, the electronic

15 representation for the grid shown in Figure 5 will be a representation comprising series of

16 numbers 8, 6, 1, 3, 4, 7, 5, 9, and 0. Each card representation will also preferably include or be

17 associated with a card identifier, serial number, or sequence number which distinguishes that

18 particular card representation from each other card representation in the set.

19   It will also be appreciated that the invention is not limited to the illustrated designations

20 comprising Arabic numerals. Any type of designation may be used according to the invention.

21 However, the Arabic numeral designations are preferred because they may be conveniently

1   represented in a digital format for processing with the various data processing devices which

2   implement gaming system 10.

3   In game system 10, players purchase or obtain card representations at a POS terminal 41,

4   or perhaps a player station 40, or perhaps some other element in the system. These purchased or

5   obtained card representations are selected from the set of card representations used to produce

6   matched card sets. Once the player has purchased or obtained a card representation he or she

7   may place it in play at a player station 40, and/or perhaps through some other element of the

8   system such as POS terminal 41. The player places the card representation in play by initiating a

9   game play request which specifies or is otherwise associated with the particular card

10   representation. A specific manner in which a game play request may be associated with a card

11   representation will be discussed below with reference to Figure 8. Generally, however, each

12   valid game play request causes the system 10 to assign a particular game play record to the

13   player. The particular game play record assigned to the player comprises the game play record

14   corresponding to the card representation (from a particular matched card set) associated with the

15   game play request/requesting player. The result associated with that assigned game play record is

16   determined by the pattern in which the set of game designations for the particular game/matched

17   card set match the designations associated with the particular card representation.

18   In the following discussion of the operation of a gaming system embodying the principles

19   of the invention, it will be appreciated that references to elements of the system are references to

20   those elements shown in previous figures, particularly Figures 1 through 4. Referring to Figure

21   6, a gaming method embodying the principles of the present invention may include receiving or

1 generating a set of game designations at a gaming establishment component 11 as indicated at

2 process block 64. A preferred form of the invention then includes matching the set of game

3 designations with card representations included in a set of such card representations as shown at

4 process block 65. This step produces a matched card set that includes a number of game play

5 records. Each game play record corresponds to a different one of the card representations. In a

6 preferred form of the invention, each game play record includes at least a card identifier for the

7 respective card representation, and a result indicator which indicates the result of the game play

8 record, that is, the result of the match between the set of game designations and the particular

9 card representation. The game play record may also include data defining the actual card

10 representation. Details and variations in the game play records will be discussed further below

11 with reference to Figure 10.

12 As shown at process block 66 in Figure 6, the illustrated method further includes storing

13 the data representing the matched card set in a suitable data storage device. In the

14 implementation shown in Figures 1 and 3, the steps of receiving/generating the set of game

15 designations, matching the game designations to the card representations to produce the matched

16 card set, and storing the data representing the matched card set are all performed by operational

17 program code executed at card set computer 26. In particular, matching program code performs

18 the matching step and game set storage program code performs the storage step. Where card set

19 computer 26 functions as the designation generating device, it also executes a suitable

20 designation generation program which may invoke a random number generating function to

21 generate the desired set of game designations. Otherwise, card set computer 26 simply includes

1   some arrangement for receiving a set of game designations as needed to produce a matched card

2   set.

3   In one preferred form of the invention, the process of receiving a set of game designations

4   and producing matched card sets is repeated a number of times at a start of a gaming session to

5   produce a number of matched card sets. The number of matched card sets may be necessary to

6   ensure that the gaming system does not run out of game play records in the course of a gaming

7   session. Also, several different bingo-type games may be in play at any given time in the

8   preferred gaming system, and a different matched card set may be required for each different

9   game in play. In fact, each matched card set represents an individual bingo-type game. In one

10   preferred implementation, a player may have a choice of wager level; one credit, two credits, or

11   three credits for example, where each credit is equivalent to some monetary amount. In this case,

12   game play requests at different wager levels may actually enter the player in different bingo-type

13   games/matched card sets. Different matched card sets are also required to respond to different

14   game play requests associated with the same card representation. That is, a given matched card

15   set will include only a single game play record corresponding to each card representation in the

16   set of card representations used to produce the matched card set. Once a game play record

17   corresponding to a particular card representation is assigned to a player in the course of play, the

18   next game play record assigned in response to a game play request associated with that same card

19   representation must come from another matched card set.

20   It will be appreciated that matched card sets may be generated very quickly with current

21   data processing devices and techniques. It may therefore not be necessary to produce and store

1   many different matched card sets for play in the present gaming system. Rather, a matched card

2   set may be produced only as necessary in order to service or respond to play requests initiated by

3   players in the gaming system. In this alternate form of the present invention, the central

4   computer may simply await a game play request by a player, determine if a matched card set is

5   currently available or in play, and if not, generate a new matched card set. The game play request

6   is serviced (a game play record is assigned) from the matched card set that is in play, or if a new

7   matched card set is created, from the new matched card set.

8   The matched card set storage step 66 in Figure 6 is performed initially at card set

9   computer 26 in the illustrated system 10. However, the preferred form of the invention utilizing

10   central computers 34 and 36 in Figure 3 also stores matched card sets in storage associated with

11   the central computers. As discussed further below, the game play records are preferably assigned

12   to players directly from the central computers 34 and 36 rather than from card set computer 26.

13   Referring now to process block 67 in Figure 6, the illustrated method also includes

14   assigning a game play record from an appropriate matched card set in response to a game play

15   request initiated by a player either at a player station 40 (Figure 3) or perhaps at a POS terminal

16   41. In the preferred form of the invention, this assignment step is performed by game play

17   assignment program code executed at the central computer (34 or 36 in Figure 3) receiving the

18   game play request. As will be discussed further below with reference to Figures 8 and 9, a

19   central computer, 34 for example, monitors for the receipt of a game play request. If the request

20   is valid, the respective central computer assigns a game play record from the appropriate matched

21   card set to the requesting player as shown at process block 67 in Figure 6. Sufficient data is then

1   communicated back to the device through which the game play request was initiated to give the

2   player the result of the game play. This data includes a result indicator which may comprise as

3   much as data sufficient to define the card representation corresponding to the assigned game play

4   record together with the designation set used in the matching step 65, or as little as a code for

5   indicating the result. Regardless of the manner in which the game play result is communicated to

6   the player, the method includes the step of displaying the result associated with the game play to

7   the player as shown at step 68. The manner in which the result may be displayed is discussed

8   below with reference to Figures 7 and 8.

9   The form of the invention illustrated in Figure 7 includes monitoring for a game play

10   request associated with a card representation that achieves a game ending winning pattern in the

11   respective matched card set. This monitoring may be performed under the control of game

12   ending play monitoring program code which preferably detects an indicator in the assigned game

13   play record to identify whether the result is for a game ending pattern or otherwise. If the

14   assigned game play record corresponds to a bingo card representation that is not matched in a

15   predetermined game ending pattern, as indicated by the inquiry at decision block 69a in Figure 7,

16   the process loops back to the point above the game play record assignment step (67) and the

17   system waits for the next game play request. However, if the assigned game play record

18   corresponds to a bingo card representation matched in the game ending pattern, the process

19   preferably, but not necessarily, includes switching to a new bingo-type game represented by a

20   new matched card set as indicated at process block 69 to effectively withdraw that matched card

21   set from further play. This switching is preferably performed under the control switching

1   program code executed by a suitable processing device in the system. After switching to the new

2   matched card set, the method includes simply waiting for the next game play request. It will be

3   noted that there may be unassigned matched card representations remaining in the matched card

4   set after the game play record corresponding to the card representation having the game ending

5   pattern has been assigned and is held by a player. Any of these unassigned matched card

6   representations and corresponding game play records are preferably disregarded by the system

7   and are not used.

8   Figures 7 and 8 illustrate the processes performed at the gaming floor devices shown in

9   Figures 3 and 4 with respect to the present invention, while Figure 9 illustrates the processes

10   performed at a central computer 34 or 36 shown in Figure 3. In the preferred implementation of

11   the invention shown in Figure 3, each of the gaming floor devices cooperate with a particular

12   central computer, and thus it is necessary to refer to a particular central computer when

13   describing the game floor device processes. For purposes of example, all of the processes

14   described with reference to Figures 7 and 8 will refer specifically to central computer 34;

15   however, it will be appreciated that the other central computers cooperate with their respective

16   gaming floor devices in the same fashion. Similarly, Figure 9 will be described with reference to

17   central computer 34 in order to simplify the discussion, although the identical processes are

18   performed by each central computer in the system.

19   Figure 7 illustrates the various processes performed at the POS terminals 41 shown in

20   Figures 3 and 4. The primary function performed through POS terminals 41 for purposes of the

21   present invention is to enable players to purchase or obtain bingo cards or bingo card

1   representations for later use in making game play requests in the system. As shown at process

2   block 70 in Figure 7, player enters a bingo card request at POS 41 either by operating controls

3   associated with the POS themselves or by making a request to a POS operator or cashier.

4   Regardless of how the bingo card request is entered at POS 41, the POS communicates the

5   request to the respective central computer system, central computer 34 in our example, as shown

6   at process block 71. Central computer 34 responds to this communication by assigning bingo

7   card representations in the process described below with reference to Figure 9, and then sends

8   bingo card assignment information back to the POS 41 through which the request was entered.

9   The respective POS 41 receives the bingo card assignment information as shown at process block

10 72 and then uses this information to print, encode, or otherwise produce a player's bingo card as

11 shown at process block 73. The player's bingo card (or simply "player's card") preferably

12 comprises some physical card that enables the player to later place one or more bingo card

13 representations in play in a game offered through the present invention.

14   The specific manner in which the steps shown in Figure 7 are performed may vary widely

15 within the scope of the present invention from one implementation to the next. For example,

16 some systems may require that every game play request made by a player be associated with a

17 different bingo card representation whereas other systems may allow a player to place the same

18 bingo card representation in play in one game play request after another. Depending upon which

19 of these system rules apply, the step of entering a bingo card request at process block 70 in

20 Figure 7 may include an indication of the number of bingo card representations the player wishes

21 to obtain. Alternatively, where a player may or must obtain a number of bingo card

1   representations at POS 41, the POS may go through the separate steps shown in Figure 7 for each

2   bingo card representation.

3   The nature of the communications required in the steps shown at process blocks 71 and

4   72 may also vary widely within the scope of the invention. It will be appreciated that any

5   suitable communications technique and protocol may be used to facilitate the communications.

6   One preferred system uses TCP/IP communications. Also, the data that must be communicated

7   depends upon the manner in which the system is implemented. For example, the bingo card

8   assignment information received at process block 72 may include simply bingo card identifiers or

9   serial numbers or the entire set of data required to define each bingo card. An example of this

10   data for defining a bingo card is described above with reference to Figure 5. Also, where the

11   players are assigned cards in a set sequence from the bingo card or card representation set, a

12   communication identifying the bingo card representations assigned to the player may include a

13   starting sequence identifier from the bingo card representation set and a value representing the

14   number of bingo card representations to be assigned. Where bingo card identifiers, serial

15   numbers, or sequence numbers are used, and where the player bingo card includes

16   representations of the assigned cards or all of the data required to define a card, POS 41 may be

17   required have access to a bingo card representation data set or perm that correlates the various

18   card identifiers, serial numbers, and/or sequence numbers to the data required to define the

19   respective card.

20   The player's bingo card produced at process block 73 in Figure 7 may also take many

21   forms within the scope of the present invention. In one form of the invention, a printer at POS

1   41 prints a separate card for each bingo card representation requested by the player, and each

2   such card includes a reproduction of the respective bingo card. Preferred forms of the invention

3   will, in addition to or in lieu of the actual representation of the bingo card, print or record on the

4   player's card a card identifier, serial number, or sequence number, or the set of data required to

5   define the bingo card. This information may be printed in bar code form, on magnetic media, or

6   in any other suitable machine readable form. However, other forms of the invention will print

7   the actual card identifier, serial number, or sequence number that identifies the card and require

8   that the player manually enter the identifier to place the card in play.

9   The discussion above refers to POS 41 as the element in the gaming system at which a

10   player purchases or obtains bingo card representations to place in play according to the invention.

11   However, it will be appreciated that certain implementations of the invention may allow a player

12   to purchase or obtain their bingo card representations at player stations 40. Thus, the process

13   steps shown in Figure 7 may in fact be performed at player stations 40.

14   Referring now to Figure 8, in addition to obtaining or purchasing bingo card

15   representations as may be possible through player stations 40 the preferred process at a player

16   station 40 requires a player to enter a game play request as indicated at process block 80. This

17   game play request may be entered in any number of fashions through suitable player controls

18   associated with the respective player station. Since a game play request according to the

19   invention ultimately has the effect of entering a bingo card representation in a bingo game

20   according to the invention, the step of entering a game play request may include steps allowing or

1   requiring the player to identify a particular bingo card representation in the event the player has

2   obtained or purchased multiple such bingo cards.

3   In response to the player's entry of a game play request, player station 40 communicates

4   the game play request to the respective central computer as indicated at process block 81. The

5   information included in this communication of the player's game play request at least includes

6   sufficient information for the central computer to identify a bingo card representation being

7   placed in play. This information may include at one extreme the entire set of data required to

8   define the bingo card representation and at the other extreme a card identifier, serial number, or

9   sequence number, or even a player station identifier. Also, where the player has been assigned

10   only a single bingo card, an identifier for the player or possibly the player's player station has the

11   effect of defining the bingo card representation being placed in play.

12   In response to the forwarded game play request, the central computer system assigns a

13   result corresponding to the bingo card representation placed in play from a matched card set as

14   described below with reference to Figure 9. Player station 40 then receives this communication

15   from the central, 34 in this example, as indicated at process block 82. The result may be

16   communicated in the form of a result code, a prize value, or data sufficient to define the result of

17   the matching between the respective bingo card representation and the designation set (ball draw)

18   used for the respective matched card set. The process according to the invention may also

19   include communicating the entire designation set to player station 40 in addition to or in lieu of

20   the result. Where the result itself is not communicated to player station 40, the player station

21   may then use the designation set to identify the pattern matched for the bingo card placed in play

1   and from that information obtain the result or prize for the game play. The result or prize may be

2   looked up in data stored at player station 40 or at some other element in the system.

3   Regardless of how the result of the game play is identified or obtained at player station

4   40, the process at the player station includes displaying the result as indicated at process block 83

5   in Figure 8. The steps involved in displaying the result associated with a game play record as

6   indicated at process block 83 may vary significantly within the scope of the invention. For

7   example, player station 40 may actually display the grid or another arrangement representing the

8   bingo card and allow the player to daub the card. It is noted that since the game play request for

9   which the result was returned was associated with the bingo card representation and thus the card

10   structure or at least an identifier for the card structure was known at player station 40 at the time

11   the game play request was generated. Daubing the card in this case would require matching

12   designations on the grid to designations included in the respective set of game designations for

13   the particular bingo-type game. This matching could be performed by the player at player station

14   40 or could be performed by the system in response to a daubing request entered by the player in

15   some fashion. The daubing would allow the player to identify whether there are any patterns of

16   matching designations which represent a win in the particular game. Player station 40 may also

17   be programmed to notify the player of winning patterns matched on the graphical card

18   representation and prompt them to daub either manually or by entering a daub request to allow

19   the system to daub the bingo card representation in play. Daubing a graphical representation of a

20   bingo card at a player station may be thought of as manual daubing whether the daubing is

21   performed by the player or performed by the player station or some other element of the system

1   at the request of the player. Also, in addition to a manual daubing step, a gaming system

2   according to the invention may require a separate input by the player to claim the bingo prize or

3   result associated with the game play request. Again the player may be prompted by the player

4   station to make any additional prize or result claiming action or input prior to displaying the

5   result at process block 83.

6   Alternatively to this manual daubing and any additional prize or result claiming inputs at

7   player station 40, a gaming system according to the present invention may rely on the matching

8   of designations previously performed in the process of producing the matched card set. In this

9   mode of play, the game play request for a play entered by the player at player station 40

10   represents a request for automatic daubing. Since no daubing is required at player station 40, the

11   data communicated from the central computer 34 to the player station need only include a result

12   indicator containing information on whether the corresponding bingo card representation

13   produced a winning or losing pattern when matched with the respective set of game designations.

14   However, it may be desirable to still send to player station 40 data defining the designation set

15   used to produce the matched card set from which the result was taken.

16   In any daubing or prize claiming arrangements, the result of the game play request, that is,

17   the result associated with the game play record assigned to the player, may be displayed in any

18   number of fashions. For example, the result may be displayed as spinning reels imitating a slot

19   machine. The spinning reels would stop at a point indicating a win or loss according to the result

20   dictated by the game play record corresponding to the player's bingo card representation place in

21   play and according to some predefined meaning of reel designation combinations. As other

1   examples, the results may be displayed as a horse race, poker hand, or in any other desired

2   fashion. In a fully automatic daubing system, the player may not even be aware he or she is

3   playing a bingo-type game.

4   As shown in Figure 9, central computer 34 services both the requests for bingo card

5   representations entered through POS terminals 41 or perhaps player stations 40, and the game

6   play requests entered through the player stations or perhaps through the POS terminals. Central

7   computer 34 may also serve an important role in the particular game accounting arrangement

8   employed by a gaming system implementing the present invention. However, as described

9   above, the accounting aspects of the illustrative gaming system are omitted from this disclosure.

10   The central computer steps associated with servicing a request for a bingo card

11   representation are shown at dashed box 90 in Figure 9, while the steps associated with servicing a

12   game play request are shown at dashed box 91. Referring first to dashed box 90 if an input

13   received from a floor device is a request for one or more card representations, the process

14   branches from decision block 92 to process block 93. As indicated at process block 92 the

15   central computer system first assigns the number of card representations indicated by the request.

16   The assigned card representation or representations are selected from a card perm which will be

17   used to create matched card sets used in the system. The assignment step may be performed at

18   random from the card perm, or card representations may be taken sequentially from the perm.

19   The manner in which card representations are assigned to players according to the invention may

20   vary widely because the system does not rely on the card assignment procedure for ensuring

21   randomness in the assignment of results. Rather, as in any bingo game, the randomness of game

1   results is produced by matching the randomly distributed card designations on the card

2   representations and the randomly or pseudo-randomly generated designation set. In any event, it

3   may be helpful in certain implementations of the invention to be able to track which players own

4   which card representations. Thus, the bingo card assignment process may include creating a

5   database entry for each assignment correlating card or cards from the perm with the player to

6   whom they are assigned. The database in which this entry is made is preferably maintained at the

7   separate database computer 28 shown in Figure 3. After the assignment of the card

8   representation or representations, and creation of any database entries at process block 93, central

9   computer 34 communicates the assigned card representation information back to the floor device

10   through with the card representation request was entered. This communication step is shown at

11   process block 94 in Figure 9. As discussed above with reference to Figure 8, the information

12   communicated to the requesting floor device in response to a card representation request may

13   vary greatly between implementations of the invention, from information necessary to actually

14   define a card representation to an identification number, serial number, or sequence number.

15   After the assigned bingo card representation is communicated to the requesting floor device, the

16   process at the central computer returns to await another communication from a floor device.

17   It will be noted from the above discussion that there may be a relatively small number of

18   available bingo card representations in the set used to produce the matched card sets. Yet a

19   gaming facility according to the invention may accommodate a number of players equal to or

20   exceeding the number of card representations included in the card set or perm. In order to

1   service a larger number of players, the present invention may assign the same card representation

2   to multiple players.

3   As shown at dashed box 91 in Figure 9, if central computer 34 determines that the

4   communication received from a floor device is a game play request at decision block 96, the

5   central computer assigns a game play record for the game play request as shown at process block

6   97 and then communicates the assigned result back to the requesting floor device as shown at

7   process block 98. The process then returns to wait for another communication from a floor

8   device.

9   The steps taken at process block 97 in Figure 9 will depend upon how matched card sets

10   are made available in the particular implementation of the system. In one preferred

11   implementation, once a result for a given bingo card representation is assigned from a matched

12   card set, an additional matched card set is made available for responding to the next game play

13   request associated with that bingo card representation. Once the result for the same given bingo

14   card representation is assigned from this additional matched card set, yet another matched card

15   set is made available and so on. A given one of the matched card sets made available for play in

16   this implementation may be held open for play until all results are assigned, for a defined or set

17   period of time, or until a game ending winning result is assigned from the matched card set. In

18   this implementation the central computer may maintain a set of pointers for the various card

19   representations in the matched card set. Each pointer would indicate which matched card set

20   should be used for a given game play request associated with a given bingo card representation.

1   In alternative implementations, each matched card set is opened for play for only a short

2   period of time and then another matched card set is opened for play. Making each matched card

3   set available for play for only a short period of time may ensure that results will be available if

4   the same bingo card representation is placed in play several times in short succession. In this

5   implementation, central computer 34 is not required to keep track of multiple matched card sets

6   available for play at any give point in time. Also, it will be appreciated that even where a

7   different matched card set is made available for play immediately after it is exhausted with

8   respect to a card representation, the matched card sets may still be held open for play for only a

9   set period of time before being closed or withdrawn from play.

10   As discussed above with reference to Figure 8, the nature of the communication of the

11   result back to the requesting device may vary greatly within the scope of the present invention.

12   The communication may include one or more distinct sets of information, and multiple sets may

13   be separated in time. The communication may include as little as a result code or identifier.

14   Alternatively, the communication may include the data defining the designation set used to make

15   the matched card set from which the result is assigned either with or without a result code and a

16   prize value in the same or separate communication.

17   Figure 10 shows the data representing a matched card set according to one preferred form

18   of the invention. The data is stored in a table 100 including a header 101 identifying the matched

19   card set and distinguishing it from any other card set that is in play or may be created. Header

20   101 may also include information identifying the matched card set as one to be used for a certain

21   wager level and may further include information identifying or defining the set of game

1   designations used to produce the respective matched card set. Table 100 further includes a

2   number of entries 102, each entry representing a respective game play record in the matched card

3   set and corresponding to a different bingo card representation in the set of bingo card

4   representations used to create the matched card set. Each entry 102 includes an ID field 104

5   containing a card serial number or other card defining information for the respective bingo card

6   representation which corresponds to the entry. Each entry 102 further includes a prize index field

7   105, prize value field 106, and sequence number field 107. Prize index field 105 contains a

8   value indicating whether the bingo card representation which corresponds to the entry is a winner

9   or loser for the particular set of game designations with which the representation is matched,

10   while prize value field 106 contains information indicating the value of any prize for the

11   respective matched card representation and thus the prize value of the game play record. Field

12   107 contains a value for the sequence the respective entry or game play record in the table.

13   A number of these matched card sets each represented by a different data structure such

14   as table 100 are created and stored at card set computer 26 in the preferred gaming system

15   illustrated in Figure 3. Matched card sets are then transferred to a central computer, such as

16   computer 34 for example, as necessary. The preferred central computers include program code

17   for monitoring the local store of matched card sets and ensuring that requests for additional

18   matched card sets are issued in time to obtain additional sets before running out of records in the

19   currently stored set or sets. It will be appreciated that the matched card sets may be produced in

20   any suitable fashion and preferably by matching program code executed at the card set computer

21   26 shown in Figure 3. The matching program code matches each card representation in a card set

1   to a respective set of game designations to determine the result for that card and fill in the result

2   fields 105 and 106 for the table entry 102 for the respective bingo card representation.

3   The above described preferred embodiments are intended to illustrate the principles of the

4   invention, but not to limit the scope of the invention. Various other embodiments and

5   modifications to these preferred embodiments may be made by those skilled in the art without

6   departing from the scope of the present invention. For example, although a particular hardware

7   arrangement is shown for purposes of describing the invention, it will be appreciated that

8   numerous hardware arrangements are possible for implementing the present invention. Also,

9   although the operational software-controlled process steps are described as occurring at certain

10   processing elements in the system, the processing steps may be distributed in any suitable fashion

11   over various data processing elements.